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DIVISION OF FORESTRY.

FOREST AND ORNAMENTAL TREE SEED AND SEEDLINGS FOR SALE AT THE GOVERNMENT NURSERY.

The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale; the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

RALPH S. HOSMER,
Superintendent of Forestry.

DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box specimens may be mailed by parcels post. When specimens are not accompanied by letter always write your name and address in the upper left-hand corner of the package. Address all communications **SUPERINTENDENT DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.**

EDW. M. EHRHORN,
Superintendent.

THE HAWAIIAN FORESTER AGRICULTURIST

VOL. XI.

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INEFFICIENT DAIRY INSPECTION.

If the municipal authorities fail in their duty to carry out the provisions of the milk ordinance which have to do with the cleanliness of dairies from which the public is supplied with milk, upon them will fall the responsibility not only of endangering the health and lives of the people—children in particular—but of preventing Honolulu from making the finest record of any municipal district in the world with respect to pure and wholesome milk supply. For, according to Dr. Nørgaard's official reports, the testing of dairy cattle for tuberculosis has been more effectively accomplished, and that without compensation from the public treasury for cattle that had to be destroyed, in the City and County of Honolulu, comprising the island of Oahu, than in any other jurisdiction of which data has come to hand.

When the milk ordinance was passed, about five years ago, Dr. Nørgaard, the Territorial veterinarian, with the sanction of the Board of Commissioners of Agriculture and Forestry, undertook to do the testing of cattle. This was to enable the dairymen to comply with the provision forbidding the sale of milk from tuberculous cows without having to pay professional fees for the service, besides being in accordance with the functions of the agricultural bureau relating to the suppression of diseases of livestock. This undertaking was begun under an arrangement between the committee on animal industry of the Board and the Board of Supervisors, whereby the latter gave money and the assistance of its sanitary inspectors to help the work. Very satisfactory results from this arrangement were achieved, as all who have followed the reports of the veterinarian know. Opponents of the milk ordinance at its inception, who insisted that without a compensation provision the measure would utterly fail, have been proved absolutely mistaken. Tuberculosis has been practically eradicated from the jurisdiction, and not one claim for compensation for hundreds of cattle destroyed has been recorded.

It is regrettable to find, in view of the achievement just mentioned, that the veterinarian is compelled to report failure with regard to the other prime object of the ordinance, that of enforcing sanitation in dairies, which is particularly in the province of the municipal government that enacted the measure. He shows in his July report, printed in this number, that the milk from

many dairies is heavily charged with dangerous bacteria. This is proof that the dairy inspection by the municipality is anything but efficient. It is a condition that the public should not stand for, endangering as it does the health and lives of young and old. The ignorance and prejudice that were hurled at the milk ordinance, before and after its first draft was vetoed by the mayor, are surely of the past since the veterinarian has published figures showing that it has tremendously reduced the number of cases and still more the number of deaths from tuberculosis among children under five years of age—cases by 66 per cent and deaths by 75 per cent, for the year ended June 30, 1913. Such a record must not be allowed to be spoiled by negligence on the part of the municipal inspectors relative to the cleanliness of dairies.

STANDARDIZATION.

With especial reference to cotton growing, the *Agricultural News* (W. I.) of August 15 devotes its leading article to "Commercial Standardization in Tropical Agriculture." The article mentions sugar as an article the valuation of which has been placed upon a scientific basis, saying that in the case of other crops, in spite of a similar need being experienced, little progress has as yet been made in the direction of standardization. The following opening paragraph of the article is worthy of attention by growers of all tropical products:

"In the production of every class of raw material that has to undergo manufacture before being sold to the consumer, it is very desirable, and indeed necessary, that scientific methods should be available for the precise determination or standardization of the so-called commercial grades. The introduction of a system having this object is particularly favorable to the interests of the producer or grower, for it assists him in forming a true judgment of the market value of consignments, and enables him to frame a definite idea of the class of material he should aim at producing. On the manufacturer's side, also, benefit accrues, from the fact that he is more likely to be supplied with the particular grade he is in need of, and this in uniform quantities."

It is gratifying to learn that the Territorial veterinarian has at last been able to enlist the county governments of the other islands than Oahu in the work of bovine tuberculosis control.

Dr. Nørgaard's zeal in guarding against the introduction of rabies to these islands will one day be appreciated. A single case of the awful malady slipping in would instantly silence all cavilling at the precautions, but in that event no doubt those who carp at the present restrictions would be first to blame the vet. for letting it happen. Such is human nature.

It is wonderful what a quantity of prohibited fruits and vegetables is attempted to be brought into these Islands every month. One should suppose that the foreign consuls would long ago have succeeded in making it generally known in their respective countries that these things are contraband except when accompanied by a Federal permit, and absolutely with respect to certain growths and certain countries of origin.

Any month's report of the division of entomology, with its record of pests intercepted, must create the conviction in the minds of all who read it that, were it not for the eternal vigilance exercised, tillage of the soil in Hawaii would be the most desperate form of human activity. It would be fighting an alliance of millions of foes.

Reports of fruit fly control by means of the parasites introduced by Dr. Silvestri from Africa seem to be more encouraging each successive month. The breeding of fresh contingents from the original distribution fields would indicate that these natural enemies of the pest have been locally established.

The report of the superintendent of forestry for July shows that the fencing of forest reserves is being done in a substantial manner. Anyone who has noticed the difference in forest growth between adjacent lands fenced and unfenced in these Islands will realize the importance of this branch of the work of the division of forestry.

Mr. Hosmer's encomiums passed upon the park creations at Kalaheo homesteads on Kauai ought to awake emulation on the part of homesteaders elsewhere.

A distribution of 13,692 tree plants to the general public in July, together with a total of 70,000 for the season to plantation and other corporations, shows that the forestation of bare spots in the islands is going ahead in magnificent style.

Superintendent Larrison's anticipation of "a large irrigation and power project which will serve leeward Kauai," as a result of the operations of the division of hydrography, will give an idea of the value of the work being done on all the islands by that branch of the bureau of agriculture. In time countless millions of gallons of water now wasting into the sea will be controlled for the purposes of agriculture, manufactures and the people's comfort. Honolulu, also, will shortly be informed of available resources now popularly unknown from which to supply its citizens with the additional water that the growth of the city will demand.

In this number will be found the proclamation of a new rule for the protection of the watersheds in Nuuanu and Makiki valleys, Honolulu.

Under the head, "Recent Progress in the Cultivation of the Sugar-Cane," the *Agricultural News* (W. I.) copies from the *International Sugar Journal* for July an abstract of the report of the committee on the cultivation and fertilization of unirrigated plantations presented at last meeting of the Hawaiian Sugar Planters' Association.

DIVISION OF ANIMAL INDUSTRY.

Honolulu, July 31, 1914.

The Board of Commissioners of Agriculture and Forestry.
Gentlemen:—

Bovine Tuberculosis and the Local Milk Supply.

As stated in my last monthly report the tuberculin testing of the dairy cows of the City and County of Honolulu will be resumed shortly or when the required tuberculin is received from Washington. The new improved eartags have already been received, a sufficient number having been secured to allow of their application to all tested cows in the entire Territory, and it is hoped that their use, in connection with the free supply of tuberculin and such services as the deputy Territorial veterinarians may be able to render, will add greatly to the extension of this important work to many districts on the other islands, where the eradication of bovine tuberculosis is still in its incipency. With the exception of Kauai, where the disease undoubtedly gained an early foothold with imported breeding stock, it is not expected that any such percentages of diseased animals will be met with as were encountered here at the beginning of the work. But unless supported financially by either the territorial or the respective local authorities the deputies cannot undertake a systematic eradication campaign such as was done here, but must apply themselves to it as opportunity and other duties will permit. As will be seen from the appended report covering the laboratory work done during the month of July the hygienic condition of the local dairy stables has not improved at the same rate as the sanitary condition of the dairy animals. With practically all diseased animals eliminated from the herds the bacterial count has in many cases increased instead of decreased, so what has been gained by removing the actual infectious disease germs from the market milk is frequently offset by the presence of disease producing filth germs by the million. This matter, however, will be dealt with in a separate paper now being prepared and until ready for publication it is recommended that the appended list of bacterial

counts be withheld in order to give the milk producers, some of whom work under disadvantageous conditions, an opportunity to improve their methods without first driving their customers away.

The Introduction of Non-Declared Dogs on Naval Vessels.

As will be seen from the appended correspondence and clippings attempts have again been made to bring dogs from rabies infected countries into the Territory in violation of the quarantine regulations. This applies in one case only to a dog on board the U. S. transport Thomas, while the U. S. S. Rainbow, direct from the Philippines, arrived with two dogs on board in violation of a strict federal regulation. These dogs could not even be landed here in quarantine, and were therefore destroyed. The U. S. S. Alert had on board four dogs, which are now all in quarantine, which also applies to one declared dog on board the U. S. transport Dix. Both the U. S. West Virginia and North Dakota had dogs on board while here recently, one of which at least was seen ashore.

So far as the transport service is concerned this office has been assured of the future strictest compliance with the local regulations, while the question of dogs being brought here from the Philippines on U. S. vessels has been referred to the proper authorities in Washington, D. C.

Cerebro Spinal Meningitis.

This disease has again made its appearance among the horses and mules on Maui and a letter is herewith appended from Dr. Fitzgerald, requesting my assistance in person. As a number of new theories as to dealing with this disease were advanced at the London International Veterinary Congress, the advance sheets of which have been received here, I would recommend that his request be complied with and that I be directed to visit Maui for the purpose of studying this disease as well as for the inauguration of a bovine tuberculosis campaign.

Very respectfully,

VICTOR A. NORGAARD,
Territorial Veterinarian.

DIVISION OF ENTOMOLOGY.

Honolulu, July 31, 1914.

Board of Commissioners of Agriculture and Forestry.

Gentlemen:—I respectfully submit my report of the work performed by the Division of Entomology for the month of July, 1914, as follows:

During the month 37 vessels arrived at the port of Honolulu, of which 20 carried vegetable matter.

<i>Disposal</i>	<i>Lots</i>	<i>Parcels</i>
Passed as free from pests.....	1016	20,590
Fumigated	13	36
Burned	33	33
Returned	4	4
Total inspected	1066	20,663

Of these shipments 20,456 packages arrived as freight, 117 packages as baggage of passengers and immigrants and 90 packages by the U. S. mail.

Rice and Bean Shipments.

During the month 22,569 bags of rice and 2,434 bags of beans arrived from Japan and 20 mats of rice from China. All of these shipments were thoroughly inspected and were found free from pests.

Pests Intercepted.

Twenty-three packages of fruit and 6 packages of vegetables were found in the baggage of passengers and immigrants from foreign countries, all of which being prohibited were destroyed. Four packages of soil arrived by mail from Manila and were seized and the owner notified that soil is prohibited from entry here. This soil was sent here to be analyzed but the consignee did not care to forward the same to the Coast for this purpose, so it was burnt. Four packages of plants and seeds were returned to shippers in foreign countries as being prohibited in the mails under the rules and regulations of the Federal Horticultural Board. On an azalea plant from Japan were found a few flea beetles and the plant was fumigated before delivery. On a shipment of camellia plants from Japan we found some nymphs of a *Hemipteron* crawling on the cloth covering on board the steamer. We immediately had the packages placed in the fumigating room and treated with gas. After fumigation we found all crawling insects dead, among them being some caterpillars. Four boxes of Mexican limes arrived on the S. S. Lurline and as all Mexican fruit is contraband the boxes were seized and the consignee noti-

fied. As he did not care to return them to the shipper they have been burnt. A small lot of horse beans badly infested with the bean weevil (*Bruchus pisorum*) were destroyed.

Beneficial Insects.

Mr. Muir sent a box of soil containing the larvae and pupae of the Japanese rose beetle supposed to be parasitized. I opened the box in the presence of Mr. O. H. Swezey of the H. S. P. A. Mr. Swezey removed all the insects and turned all the soil over to me and it was taken to the garbage dump and burned. Mr. Swezey reports that none of the parasites have so far hatched and he has little hope for this sending, it having been too long on the way. Mr. Swezey also received a tube containing *Diptera* pupae from Mr. Muir, but unfortunately these also arrived dead.

Six lots of Japanese beetle fungus were distributed during the month. Dr. Silvestri sent nine tin tubes containing dungfly material: Only three tubes contained live beetles, fourteen in all, which were liberated in the same locality as the other sendings. This shipment left Italy June 14, arriving here July 3. All material contained in the tubes was fumigated and burnt so as to avoid accidental introduction of any plant germs or noxious insects. Considerable time has been devoted to parasite work. During the month 7,875 parasites were distributed on Oahu and the other islands. Of this number 2,475 were *Opius humilis* for the fruit fly and 2,000 were parasites for the hornfly; the rest were liberated in vegetable gardens for the melon fly. During the month we have been able to rear the three species of dungfly parasites from material gathered in the field. We have also obtained the *Opius* from several fruits gathered in localities about Oahu and from coffee gathered at Kona, Hawaii, we have reared 90 *Opius* from 100 fruitfly pupae. The parasite was first liberated in Kona about a year ago so that the *Opius* no doubt is established in that locality.

Hilo Inspection.

Brother M. Newell reports the arrival of seven steamers and one sailing vessel at the port of Hilo, five of which brought vegetable matter consisting of 215 lots and 2,443 packages. The plants in one box of shrubs had the soil removed before delivery. The steamer Anyo Maru arrived direct from Japan and brought 5,833 bags of rice and 195 bags of beans, all of which were found free from weevils and passed.

Inter-Island Inspection.

During the month of July 60 steamers plying between the islands were attended to and the following shipments were inspected and passed:

Plants	75	packages
Taro	721	"
Fruit	12	"
Vegetables	18	"
<hr/>		
Total passed	826	"

The following packages were refused shipment on account of being either infested with pests or having objectionable soil attached to plants:

Plants	16	packages
Fruit	12	"
Vegetables	1	"
<hr/>		
Total refused	29	"

Respectfully submitted,
E. M. EHRHORN,
Superintendent of Entomology.

DIVISION OF FORESTRY.

Honolulu, July 31, 1914.

Board of Commissioners of Agriculture and Forestry.

Gentlemen:—I have the honor to submit the routine report of the Division of Forestry for July, 1914, and as usual to transmit herewith that of the forest nurseryman.

Forest Reserve Fences.

Another forest reserve project was got under way this month, the building of fences on either side of the government trail leading up to the Kolekole Pass in the Waianae hills, across the Lualualei forest reserve, Oahu. The contract was signed on July 15, with Mr. J. K. Luka of Waianae. Work on the fence is now in progress.

From July 16 to 19 I was on the Island of Kauai, primarily to inspect the forest fence across the government land of Wailua, mauka, above Lihue. This stretch of fence closes the gap between existing forest fences built and now maintained respectively by the Lihue Plantation and the Makee Sugar Company. The Wailua fence was built under contract by Mr. Kaina D. Lovell of Anahola, who did his work in a thoroughly satisfactory way. The fence has five wires and is built of redwood posts set 20 feet apart, with two northwest spreaders between.

In connection with the fences now being built on the boundary of the Waiaha Spring forest reserve in North Kona, Hawaii, ar-

rangements have been completed for the erection of six of the Division of Forestry's metal forest reserve monuments at important corners.

During the last week of the month a final inspection was made of the forest fence on the mauka boundary of the Ninole homestead tract, Kau, Hawaii. The minor repairs and additions found necessary at the time of the first inspection having been made, and the fence now being in good condition, the job was accepted as completed.

Reconstruction of Forest Fences in Kau.

As the result of a special trip to Hawaii, July 25-31, I have here to report as follows on the condition of the fences on the boundaries of the Kau forest reserve. These fences, it will be recalled, were the subject of considerable discussion during 1912, between the board and the adjoining plantation companies, as the result of which the fences along the whole mountain section of this reserve, at both its east and west ends, have been or are about to be reconstructed. Under the requirements of government leases the Hawaiian Agricultural Company and the Hutchinson Sugar Plantation Company are under obligation to maintain the fences around the Kau forest reserve, but by mutual agreement with these companies, Mr. A. W. Carter, representing the Kahuku Ranch, has arranged to fence portions of the line along the Kahuku boundary. This boundary has recently been relocated by Mr. G. F. Wright. Most of the way along Kahuku the reconstructed fence is on the line determined by him.

The section of the Kau forest reserve fence built by the Hawaiian Agricultural Company runs from a point in Wood valley eastward through the government land of Kapapala, up through the forest on that land, and then westward to and along the Kahuku boundary, for a distance of something over five miles from the Kahuku-Kapapala corner.

Kahuku Ranch then has a section of about five and a half miles. This has not yet been built. Then comes the fence built by the Hutchinson Plantation, a stretch of approximately seven and a half miles, to the corner where the land of Kahuku turns makai. There is a stone wall down this line for two miles or so. The remainder of it is to be fenced by Kahuku Ranch.

Going first to Naalehu I inspected the section of the fence erected by the Hutchinson Plantation, on the mauka side of the forest. This fence is built of four wires, German make, No. 4, galvanized on iron. The posts are set 10 feet apart, of ohialehua, seven feet long, with a minimum diameter of 8 inches. Acting for the manager of the plantation, Mr. George Gibb, the actual construction of the fence was under the direction of Mr. Eric H. Edwards, manager of the Waiohinu Ranch. This fence is a satisfactory one in every way. It should give good service.

Under an arrangement with the owners of Kahuku Ranch,

Mr. W. H. Shipman has recently completed a clearing out of the wild stock on the mountain. Only a very few head of wild cattle are now left in the forest and these are being hunted by the adjoining ranchmen.

Around the east end of the reserve the fence of the Hawaiian Agricultural Company was entirely rebuilt during the year 1913. The former fence line was followed so that advantage could be taken of post holes blasted in the pahoehoe, but new posts were set throughout and new wire used. The total length of this fence is approximately 15 miles. The wire is of the best English make, galvanized No. 7. There are five strands in the fence. The posts, ohia-lehua or split koa, are set eight feet apart, and are almost without exception larger than the minimum diameter requirement of 8 inches. Wherever necessary the posts are guyed and braced. Especial care was taken across gulches and ravines to make the fence tight with extra wires. An excellent piece of work, this fence ought to be good for many years of effective service.

One more stretch of forest fence, across the Bishop Estate land of Punaluu, has also recently been completed by the Hawaiian Agricultural Company. This, with two lateral fences, respectively along the side of the Puu Enuhi ridge and adjoining the cane fields on Mohokea, completes the line of fences surrounding the east end of the Kau forest reserve. Between the regular forest fence and the cane field fences above Pahala, the entire east end of the reserve is now protected from the entrance of stock. All these forest fences were constructed under the personal supervision of Mr. Julian Monsarrat, who, for almost twenty years now, has efficiently carried out the wishes of the Hawaiian Agricultural Company in protecting this part of the Kau forest.

Reports and Statements.

During July I prepared for transmission to the Governor a statement of the work of the Division of Forestry for the past fiscal year, drew up a revised estimate of expenditures for the next six months, for the use of the commissioners; and wrote two reports recommending the creation of a forest reserve in the districts of Kipahulu and Kaupo, Maui, and of a so-called "forest park" along the Volcano road, Olaa, Hawaii. A public hearing to consider these projects has been set by Governor Pinkham for August 19, 1914.

The Planting on Kauai.

While on Kauai early in July, I visited the Papaholahola Spring reserve above Homestead, where, under the immediate direction of Mr. Walter D. McBryde, the Division of Forestry maintains a sub-nursery for the growing and local distribution of seedling trees, and an experimental ground for the trial of new species.

Conditions at the nursery were found to be very satisfactory. Through the recent improvement of the road the station has been made much more accessible. This should help to increase the number of plants that are annually given out. The blocks of trees in the area above the nursery are doing well. Provisional arrangements were made with Mr. McBryde for extending these plantations with other trees.

In this connection I wish officially to call attention to the tree planting by homesteaders and others in the vicinity of Homestead that has been going on in the last few years. Largely as a result in the first instance of Mr. McBryde's own efforts, the planting around Kalaheo has become general, so that now, looking mauka from Kukuilono hill, one sees a condition of shaded roads and tree surrounded homes equaled by no other place in the Territory. Kukuilono Park itself—the block of government land on the hill of that name which Mr. McBryde has beautified and thrown open to the free use of the public—has now become one of the attractions of Kauai. It is well worthy of being featured as an asset of the Garden Island that should not be overlooked.

Routine and Nursery Work.

As usual the staff of the Division of Forestry was kept busy during July with its regular routine work. The report of the forest nurseryman, transmitted herewith, gives the details of the plant growing and distribution.

Very respectfully,

RALPH S. HOSMER,
Superintendent of Forestry.

REPORT OF FOREST NURSERYMAN.

Honolulu, July 31, 1914.

R. S. Hosmer, Esq.,

Superintendent of Forestry.

Dear Sir:—I herewith submit a report of the principal work done during the month of July:

Nursery.

Distribution of Plants.

	In seed boxes	In boxes transplanted	Pot grown	Total
Sold . . . . .	.....	....	274	274
Gratis	10,000	460	2232	12,692
Military Posts . . . . .	.....	....	606	606
Schools . . . . .	.....	....	120	120
	<hr/> 10,000	<hr/> 460	<hr/> 3232	<hr/> 13,692

Collections.

Collections on account of plants sold amounted to.....	\$ 6.20
Rent of building, nursery grounds.....	35.00
Total	<u>\$41.20</u>

Plantation Companies and Other Corporations.

The distribution of plants under this heading amounted to 500 in seed boxes and 168 pot grown. Total, 668.

We have received an order for 20,000 assorted tree seedlings to be delivered in September. Mention was made in a former report of receiving an order for 50,000 seedlings to be delivered before the end of the year, making 70,000 altogether for the coming planting season.

Makiki Station.

The work at this station has been principally the raising and transplanting of seedlings, attending to the new introductions and adding to our stock which we are getting ready for the coming Arbor Day and the general planting season.

Honolulu Watershed Planting.

The koa and kukui trees planted on and in the neighborhood of Sugar Loaf hill are doing very well. The two men are keeping them clear of weeds and grass and are also getting ready a stock of trees in case they should be required for additional planting in the near future.

Advice and Assistance.

The writer has answered inquiries and made visits as follows: By telephone, 6; by letter, 3; at nursery, 7; visits, 9.

Respectfully submitted,

DAVID HAUGHS,
Forest Nurseryman.

DIVISION OF HYDROGRAPHY.

Honolulu, Aug. 14, 1914.

Board of Commissioners of Agriculture and Forestry.

Gentlemen:—The following report of operations of the Division of Hydrography for July, 1914, is respectfully submitted:

Kauai.

Heavy rainfall on the uplands and on windward Kauai continued during the month. A rain gage maintained at a new station on the Lumahai stream at an elevation of about 700 feet above the sea level has recorded an average of an inch a day during the past two months.

Mr. Dort, assisted by Mr. Horner, completed a Stevens automatic clock register station on the Wainiha stream at an elevation of about 850 feet above sea level, and about one and one-half miles above the power canal intake. The construction of this station, which will record the entire flow of the stream, consumed the greater part of the month. This installation completes the construction work started nearly a year past in relation to the measurement of all large windward Kauai streams which, with the exception of the Wainiha stream, are practically all wasting into the sea. This group of streams is made up of the Wainiha, Lumahai, Waioli, Hanalei and Kalihiwai streams, with an estimated minimum discharge at the 750 feet level of about 260 million gallons per 24 hours. It is believed that in time, these waters will be diverted into a large irrigation and power project which will serve leeward Kauai. For topographical reasons it is believed that the water will be diverted at an elevation of about 700 feet and the measurement stations were all established above this level.

The installation of these stations has involved an immense amount of hardships and labor under the most adverse conditions to be found on the island. Many miles of foot trail have been constructed up the various valleys. All supplies to all but the Wainiha station had to be carried in on men's backs and the work was completed under disagreeable weather conditions. The stations are of a permanent type, and the records therefrom will prove of immense value to Kauai water users. Of the five streams, two, the Hanalei and Waioli, are owned by the Territory of Hawaii.

Oahu.

Seven coöperative clock register stations were established during the month. Five of these, which were constructed and established by Mr. Kimble, were Stevens automatic clock register stations for the Kahuku and Laie plantation companies on windward Oahu. These stations will measure the run-off of the Malaekā-

hana, Koloa, Waialele and Kahawainui streams. The remaining two were clock register stations established in coöperation with the U. S. Army on the lower south fork of the Kaukonahua, just above Wahiawa reservoir and on the Schofield Barracks water supply ditch, above the storage reservoir. These were constructed by Mr. Kimble in June, but the clock registers were not available until July.

Station sites were selected for weir stations in connection with the experimental work in relation to water duty for cane and ditch seepage losses which is to be taken up with the H. S. P. A. Experimental sub-station at Waipio.

Miscellaneous measurements taken on July 10 showed the total discharge of the Waiau springs near Waiau, Oahu, to be about eleven million gallons per day.

On July 23 a reconnaissance was made in the vicinity of Leilehua gulch with the superintendent of the Hawaii Preserving Co. at Wahiawa in connection with the possibility of drilling a well in that vicinity to investigate underground water conditions. The entire cost of this work will be borne by the coöperating company.

Mr. Kimble spent the entire month in the field on construction. Mr. Austin spent 17 days in the field on stream and rain gaging work, including nine days on Maui, and the remainder of the month in this office on computation and filing work.

Mr. Bailey spent from July 8 to 18th in the Honolulu office on Maui computation work.

Maui.

Maui enjoyed its fourth consecutive month of abnormally wet weather. Mr. Bailey spent 16 days in the field, during which time he visited 30 stream gaging stations, made 19 stream measurements at regular stations, including a number of flood measurements, and completed the construction of three foot bridges for flood measurements. During July 19 to 29th Mr. Austin accompanied Mr. Bailey and visited all clock register stations on Maui.

Hawaii.

On July 29 to 31 the undersigned accompanied the deputy attorney-general of the Territory of Hawaii to Kamuela, Hawaii, and made a number of stream and ditch measurements. These records with other data collected will probably be used as evidence in future litigation relative to the water rights of the Wai-koloa stream.

AUGUST PLANS.

Kauai.

The greater part of the month will be devoted to stream measurements. Should the coöperative parties be ready construction

work will be started on the two clock register coöperative stations on the Olokele stream and the new Anahola ditch. All equipment, materials, transportation and labor for the Olokele station will be furnished by the Hawaiian Sugar Co. All materials, transportation and labor will be furnished by the Makee Sugar Co. on the Anahola ditch station.

Oahu.

The coöperative experimental work for the H. S. P. A. at Waipio will be carried forward.

Further reconnaissance work in connection with the water resources of the Honolulu basin will be done.

A reconnaissance of the mountain waters of the Punaluu and Kaluanui valleys, above the 800-foot contour, will be made.

Mr. Kimble, who will probably be paid from territorial funds during August, has received permission to take 40 days' vacation leave, and will leave for Clear Lake, Iowa, on August 5. He expects to return about September 13.

Kauai.

Routine stream measurement work will be pushed, and a special ditch loss investigation for the Honolua Ranch Co. will be made.

Very respectfully,

G. K. LARRISON,
Superintendent of Hydrography.

CREATION OF TWO FOREST RESERVES.

Following a public hearing, Governor L. E. Pinkham on August 20, 1914, signed proclamations creating two new forest reserves, respectively on the islands of Maui and Hawaii.

The former, under the name "Kipahulu Forest Reserve," is situated in the districts of Kipahulu and Kaupo, and embraces all the forested area lying on the slopes of Mt. Haleakala above a line drawn approximately on the 2000-foot contour between the boundary of the old Hana district and the Kaupo gap. The area is 10,600 acres, of which 4600 acres belongs to the government. The remainder of the reserve consists of the great valley of Alae-nui, owned by the Kipahulu Sugar Co. The object of this reserve is to protect the streams, in view of their ultimate development for economic purposes.

The creation of the Kipahulu forest reserve practically rounds out and completes the first chapter in getting native Hawaiian forest under a proper system of administration and control. With the exception of two comparatively small areas on Oahu—Moku-leia and Hauula—all the forest land needed for the protection of

the watersheds of the important streams has now been technically set apart. A large percentage of the boundaries is fenced, and in most of the reserves trespass has now been reduced to small extent. But properly to care for the forest reserves, so that they shall render full service to the Territory, requires the organization of an efficient forest ranger service. This is the next step in forest work in Hawaii; the second chapter in making the native forests of the greatest value to all the people.

The other reserve, set apart on August 20, is called the "Olaa Forest Park," and consists of three blocks of Hawaiian forest along the Volcano road, near Glenwood, Olaa, Hawaii. The purpose of this forest park is to preserve, because of its scientific interest and scenic value, the only remaining tracts of native Hawaiian forest that are within easy reach of the tourist and visitor. The area of the Olaa forest park is 531 acres. It is set apart under the Board of Agriculture and Forestry largely for administrative reasons, being in the nature of a park rather than a forest reserve pure and simple, which is made primarily for economic reasons.

With these two new reserves, the total area of the 37 forest reserves now making up the Hawaiian forest reserve system is 798,214 acres. Of this, 546,222 acres (68 per cent) is land belonging to the Territory.

Following the usual custom, the reports of the superintendent of forestry on the Kipahulu forest reserve and the Olaa forest park are printed herewith, as are also the proclamations creating these reserves.

KIPAHULU FOREST RESERVE.

REPORT OF THE SUPERINTENDENT OF FORESTRY.

Honolulu, Hawaii, July 16, 1914.

Board of Commissioners of Agriculture and Forestry, Honolulu,
Hawaii.

Gentlemen:—I have the honor to submit as follows a report recommending the creation of a forest reserve in the districts formerly known as Kipahulu and Kaupo, Island of Maui, now classed as a part of Hana. The area in question embraces all the lands mauka of a line drawn on approximately the 2000-foot contour, between the Hana-Kipahulu district line and the boundary of the fee simple land of Kakio, on the wet side of the Manowainui gulch, below the Kaupo gap into the crater of Mt. Haleakala. The area of the proposed reserve is approximately 10,600 acres. With the exception of the great valley of Alaenui, in Kipahulu, owned by the Kipahulu Sugar Company, practi-

cally all of the land included in the reserve belongs to the Territory.

The greater part of the proposed forest reserve is land very much cut up by gulches and ridges. It rises steeply from the strip of agricultural land near the sea. The upper portions of the lands included are on the ridges bounding the crater of Haleakala. It is all under a stand of native Hawaiian forest. I suggest that the reserve be called the Kipahulu Forest Reserve.

Object.

The object in creating this forest reserve is to provide for the better protection of a series of watersheds that potentially are of importance in the development of the Territory. A number of small valleys carrying streams having more or less permanent flow are included in the reserve, but essentially the important sources of water are the streams within the tributary to the Alae-nui and Manawainui gulches. Water from the former is now diverted and used on the Kipahulu Sugar Plantation. That in the latter gulch is not now used, except in a small way for taro patches in the valley. In both these gulches there appear to be great possibilities for the development of power. It may be a long cry ahead to the time when the water that goes over these particular falls will be harnessed, but in my judgment provision ought to be made now for giving adequate protection to the sources of the supply. The setting apart as a forest reserve of the government lands on which these streams rise is an essential step in that direction.

The creation of the Kipahulu forest reserve has been contemplated for a long time. My recommendation that it be established rests on several visits to Kaupo and Kipahulu, but particularly on one made in June, 1914, with this especial object in view. The creation of the Kipahulu forest reserve will round out the forest reserve system on Maui and practically complete the chain of forest reserves needed throughout the Territory.

Description.

On the east side of Kipahulu, from the Hana district line to and including the government land of Kikoo, the government lands are under lease to the Kipahulu Sugar Company under two leases, No. 488 (expiring March 6, 1915) and No. 522 (expiring December 20, 1919). The latter covers only the lower portion of the several lands included, leaving a balance of 809 acres, of the portion under forest, not under lease. The government lands on the western side of Kipahulu are not under lease. Across Kipahulu the boundary line of the proposed forest reserve runs at or a little mauka of the upper edge of the land that has been cleared

for cane. Some of the upper fields have been abandoned in late years, but it is believed that this line marks about the limit of profitable agriculture, even if with better times these upper lands are again brought under intensive cultivation. Further mauka, especially on the western side of Kipahulu, the topography is very broken, making the land unsuited for anything but forest.

In Kaupo is one good-sized private land, Kaapahu, the upper part of which would naturally fall within the limits of the forest reserve. But in that the owner of the land, Mr. R. A. Drummond, intends to continue to use it for grazing, it has been deemed best to leave Kaapahu out of the reserve. The boundary line therefore passes around this land. Kaapahu is bounded on both sides by deep and impassable gulches. The mauka boundary of this land will eventually have to be fenced, along with certain other land boundaries in both Kaupo and Kipahulu. When the present leases held by the Kipahulu Sugar Co. run out and come to be renewed, provision should be made for fences on the forest line where necessary. Fortunately, for a good part of the way natural barriers can be used.

The government land between Kaapahu and the Hanawainui gulch in Kaupo is the only section of the proposed reserve about including which in the reserve there is any question. This is a triangular area about 7000 feet broad at the base and running up steeply for an equal distance between large gulches, to a narrow neck near the hill Ahulili. Its makai boundary is now the mauka line of the Kaupo homesteads, laid out some ten years or more ago, and two or three private grants that stop at about the same elevation. The upper portion of this triangle is covered by a heavy stand of native forest, with ie-ie vines and other undergrowth. Lower down is a fairly uniform growth of young koa trees, 20 years or so old, apparently dating from a fire, with a scattering of larger koa trees. Along with the koa the waiawi (*Psidium pomiferum*) on this and adjoining lands is found spreading rapidly and making a better development than anywhere else in the Territory. It is here a valuable tree.

For some little way above the homestead boundary the forest is open and park-like in character, with a carpet of various forage grasses. There is no important source of water on this government land. The streams in the small gulches are only intermittent, the only spring of any consequence being one located way makai, not far above the government road, on private land. This area is not now under lease. It is, however, subject to grazing by cattle. At present not very many head are at large, but there is nothing to prevent more from being turned loose at any time.

It is my judgment that the mauka portion of this triangle ought to be reserved, but that the lower section, immediately mauka of the homestead, might properly be leased for grazing. I have accordingly asked the Survey Office to fix the boundary

between arbitrary points, there being no established marks on the ground. This line will eventually have to be run out and located on the ground, at which time it should be marked with forest reserve monuments. The section below the proposed forest line could then be leased, with a provision that a fence be built running across from the Kaapahu gulch to the Manawainui pali, thus making a barrier on the forest reserve boundary.

Before fencing can be done, a number of points will have to be located and marked on the ground all the way across Hana, Kipahulu and Kaupo. This is work for which provision ought to be made. The section of boundary just suggested could be run out at the same time.

The Manawainui gulch itself, with its subdivisions, is already a natural reserve, but being all government land it had best be included in the forest reserve. Above the waterfalls and stretching up to the edge of the crater is a section of government land that was formerly used for grazing but which has been abandoned of late because it was so rough and also because the more open places had become overgrown with the weed pamakani. There is said to be only one entrance to this section—across a hogback leading in from near the trail up the Kaupo gap, at about the 4000-foot elevation. This trail is now fenced off. In that all this upper section, above Manawainui, is the source of the streams that drop into that gulch—water which I believe sometime will be required for power development,—it is my judgment that it should be included in the reserve. From conversations had with Mr. Antone Vierra and other ranch men in Kaupo, I think that such action will meet with favor rather than opposition.

Boundary.

The lower boundary of the proposed Kipahulu forest reserve may roughly be described as follows:

Starting at the southwest corner of the Hana forest reserve, the line runs across at the heads of the private grants on Kauhakani and Papaulauana to the mauka boundary of Grant 3248; thence across Alaenui to the ridge of Palikea; thence at the head of the private grants on Kikoo and Maulili, across at approximately the elevation of the waterfalls in the main valleys to a point arbitrarily to be established on the eastern boundary of Kaapahu; thence around Kaapahu to a point on its western boundary approximately coinciding with latitude $20^{\circ} 40'$; thence across on this line to the pali of Manawainui gulch; thence into and across the gulch to include the government lands therein; thence up the boundary of Kakio to the Kaupo-Kipahulu district boundary; thence around and along the same to the point of beginning.

The official and technical description of the line is now being prepared by the Survey Office.

Recommendation.

For the reasons given above I do now recommend that the board approve the creation of the Kipahulu forest reserve and request the Governor of the Territory to hold the required hearings and thereafter to issue a proclamation setting the government lands apart.

Very respectfully,

RALPH S. HOSMER,
Superintendent of Forestry.

OLAA FOREST PARK.

REPORT OF THE SUPERINTENDENT OF FORESTRY.

Honolulu, Hawaii, July 15, 1914.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I have to recommend as follows the creation of a small forest reserve in the Olaa section, Puna district, Hawaii, to be known as the "Olaa Forest Park Reserve."

The purpose of this project is to preserve for its beauty, its scenic interest and its scientific value the last remaining strip of the heavy native Hawaiian forest along the Volcano road, together with a grove of koa trees facing the road at 29 Miles. The former area consists of the untaken Olaa homestead lots bordering the Volcano road, mauka of Glenwood, between the twenty-three and the twenty-five-mile posts. It is the one place in the Territory where without effort or exertion the visitor to the Islands can still see the dense native forest in its primitive condition.

The Glenwood Forest.

The area proposed to be set apart consists essentially of lots Nos. 363, 364, 277 to 380, and 389 to 391 of the original Olaa Tract homestead subdivision, a total of 374 acres. All of these lots still vest in the government. The majority of them were never taken up. Those that were have since reverted to the Territory. All are covered with heavy forest, consisting of a stand made up principally of large ohialehua trees with a dense undergrowth of ferns, vines and shrubs. The lots named form a solid block across which runs the Volcano road. Adjoining this block are a number of privately-owned lots, on which the forest cover is of like character. It is the intention of the owners of these lots to continue to protect the forest on them. In effect this increases the size of the proposed reserve and insures the perpetuation of a block of forest large enough to maintain itself.

The government lots, especially those to the south of the road, are said to be extremely rocky, so that their value for agriculture would at best be but small. On the other hand the forest on these lots makes them, because of their location, of unique value to the Territory.

Ever since the Volcano road was first built, the Hawaiian forest along its course has been one of the most exploited features of the Island of Hawaii. With increasing attention to building up the tourist trade in the Territory it is strictly a business proposition to preserve and develop all places of special scenic attraction. From the tourist point of view the drive from Glenwood to the Volcano is a distinct asset.

"But this forest is not alone of interest from the superficial standpoint of the passing tourist. With the opening up of the surrounding country it will have increasing scientific interest from a botanical standpoint, while it may also well serve as a refuge for some of the remaining Hawaiian birds.

These being the objects of the reservation, it is to be regarded as a forest park rather than as a regular forest reserve. But for purposes of administration it can best be handled if set apart under the Board of Agriculture and Forestry.

"The second area proposed to be included in the reserve is located further up the road at 29 Miles, a small block of forest, of seven and a half acres, that I believe should also be reserved, say as Section B of the Olaa forest park. This is the stand of koa trees nearly opposite Mr. W. H. Shipman's mountain place, that was held out of the "Olaa Summer Lots" subdivision as a special "koa reserve." This koa grove is an interesting feature of the Volcano road. As the trees grow older it will be of interesting value as a part of the park.

Volcano Road Strips.

While this matter is under consideration by the board, I should like to bring forward one more suggestion which may result in increasing the area of the proposed forest park. I bring it up separately, as it involves a question of policy.

When the original Olaa tract was laid out, narrow strips of forest were reserved along the Volcano road between the twelve and the twenty-four-mile posts, with the idea of preserving the forest, just as is now proposed on a smaller scale. Unfortunately the strips were not made wide enough. When the land behind them was opened up many of the trees on the strips died. The result was that below about the eighteen-mile post the former "forest reserve" strips are now merely remnants of open land, which are now and for years have been subject to trespass; sources of annoyance to all concerned.

Mauka of the "Peck Road" at eighteen miles there is still a fair

stand of forest on some of the strips, increasing in density toward and above Glenwood. But even where the native trees have pretty much gone there exists here, should the board deem it wise to take advantage of it, good opportunity for the planting in their stead of introduced trees of suitable species.

At present the government probably has no funds that it would care to use for such work, but in time conditions may so change as to make such planting possible. For this reason it seems to me desirable that these remnants be added to and set apart as portions of the Olaa forest park.

The Board of Agriculture and Forestry has, of course, no authority or control over these strips, nor voice as to their disposition, other than as a matter of general government policy. As concerns those below eighteen miles, my personal recommendation as superintendent of forestry is that they no longer be held for forest purposes, but disposed of under the law, as the Department of Public Lands may see fit, as agricultural land. Below eighteen miles the original forest is gone. The strips there can in my judgment be used to better advantage for agriculture than for tree planting.

I believe it would be good business for the government to clean up in this way what is now an unsatisfactory land muddle.

For the reasons set forth I do therefore now recommend that the board approve the project of setting apart as the Olaa forest park reserve the three sections of government land above described, and that the board request the Governor to take the necessary steps to have the lands so set apart.

Very respectfully,

RALPH S. HOSMER,
Superintendent of Forestry.

BY AUTHORITY.

PROCLAMATION OF FOREST RESERVE IN THE DISTRICT OF
HANA, ISLAND AND COUNTY OF MAUI,
TERRITORY OF HAWAII.

Under and by virtue of the authority vested in me by the provisions of Chapter 28 of the Revised Laws of Hawaii, as amended by Act 65 of the Session Laws of 1905, and by Act 4 of the Session Laws of 1907, and of every other power me hereunto enabling, I, LUCIUS E. PINKHAM, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given as in said Acts provided, do hereby recommend and approve as a forest reserve to be called the KIPAHULU FOREST RESERVE, those certain pieces of government and privately-owned land in the District of Hana, Island and County of Maui, Territory of Hawaii, which may be described roughly as embracing all the lands mauka of a line drawn on approximately the 2000-foot contour across the land districts of Maui formerly known as Kipahulu and Kaupo, between the Kaupo Gap and the boundary of the old Hana District, and containing an area of 10,600 acres, more or less, more particularly described by and on maps made by the government survey department of the Territory of Hawaii, which said maps are now on file in the said survey department marked Government Survey Reg. Map No. 1782, and "KIPAHULU FOREST RESERVE," and a description accompanying the same numbered CSF2545, which said description now on file in said Survey Department is as follows:

KIPAHULU FOREST RESERVE.

District of Hana, Island of Hawaii.

Including portions of the Government lands of Kaumakani-Alaeiki, Kaka-hale-Kikoo, Kukuiula, and Kaniaula, and of the privately-owned land of Alaenui.

C. S. F. No. 2545.

Beginning at the East corner of this Reserve and the South corner of the HANA FOREST RESERVE, said point of beginning being approximately 4348.5 feet North and 4310.2 feet East of Government Survey Trig. Station "Ahuula," as shown on Government Survey Registered Map No. 1782, and running by approximate true azimuths and distances:

1. 58° 30' 380 feet along Government land;
2. 53° 45' 2026 feet along Grant 3057 to Nakila and Company;
3. 63° 40' 2430 feet across Government land;
4. 57° 30' 330 feet along Grant 3248 to Kunukau;
5. 356° 30' 1700 feet across Alaenui to Trig. Station Ahuula;
6. 51° 00' 265 feet along Grant 2795 to Kaleimakalii;
7. 70° 00' 281 feet along Grant 2795 to Kaleimakalii;
8. 62° 30' 465 feet along Grant 2795 to Kalcimakalii;
9. 75° 20' 970 feet along Grant 1529 to Makaliku and Ihu;
10. 75° 20' 1000 feet along land of Maulili;
11. 70° 00' 3600 feet across Government land to East boundary of land of Kaapahu (L. C. A. 8559B to W. C. Lunalilo);
12. 156° 10' 9600 feet along said land to Kaapahu;
13. 83° 10' 5148 feet along said land of Kaapahu;
14. 330° 20' 4970 feet along said land of Kaapahu;
15. 90° 00' 6160 feet across Government land to center of Manawainui Guleh;
16. Thence along center of Manawainui Guleh, direct azimuth and distance being 16° 30' 4000 feet;
17. 95° 20' 500 feet across Government land and along land of Kumunui;
18. 18° 30' 1600 feet along land of Kumunui;
19. 10° 00' 160 feet;

20. 125° 10' 1725 feet along Grant 2134:1 to Loheuma;
21. 4° 30' 600 feet along Grant 2134:1 to Loheuma;
22. 355° 00' 200 feet along Grant 2134:1 to Loheuma;
23. 87° 00' 780 feet along Grant 1449:2 to Kanakaokai;
24. Then along Grant 3457 to A. V. Marcial and along top of ridge on East boundary of Kakio to the North corner of Government land and West boundary of Alaenui, the direct azimuth and distance being 178° 15' 19,075 feet;
25. Thence along top of ridge to boundary point Palaha, the direct azimuth and distance being 162° 10' 6700 feet;
26. Then along boundary of Hana Forest Reserve to boundary point Kaumakani, direct azimuth and distance being 288° 30' 26,500 feet;
27. 330° 40' 10,350 feet along Hana Forest Reserve to the point of beginning.

Area, 10,600 acres.

And as provided by law, subject to the existing rights and leases, I do hereby SET APART as parts of the KIPAHULU FOREST RESERVE those portions of the government lands of Kaumakini-Alaeiki, Kakahale-Kikoo, Kukuiula, Kaniaula, altogether an area of 4600 acres, more or less, that lie within the metes and bounds of the above described KIPAHULU FOREST RESERVE.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.

DONE at the Capitol in Honolulu, this 20th day of August, A. D. 1914.

LUCIUS E. PINKHAM,
Governor of Hawaii.

By the Governor:
WADE WARREN THAYER,
Secretary of Hawaii.

BY AUTHORITY.

PROCLAMATION OF FOREST RESERVE IN THE DISTRICT OF
PUNA, ISLAND AND COUNTY OF HAWAII,
TERRITORY OF HAWAII.

Under and by virtue of the authority vested in me by the provisions of Chapter 28 of the Revised Laws of Hawaii, as amended by Act 65 of the Session Laws of 1905, and by Act 4 of the Session Laws of 1907, and of every other power me hereunto enabling, I, LUCIUS E. PINKHAM, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given as in said Acts provided, do hereby set apart as a forest reserve to be called the OLAA FOREST PARK RESERVE, those certain pieces of government land in the District of Puna, Island and County of Hawaii, Territory of Hawaii, which may be roughly described as the remaining area of government land along the Volcano Road under a stand of heavy Hawaiian forest, and containing an area of 531 acres, more or less, more particularly described by and on maps made by the government survey department of the Territory of Hawaii, which said maps are now on file in the said survey department marked Government Survey Reg. Maps Nos. 2250, 2411 and 2577 and "OLAA FOREST PARK RESERVE," Sections A, B, and C respectively, and descriptions accompanying the same in two parts numbered C. S. F. 2538 and 2544 (the description of Section C, the road strips, appearing directly on Map No.

2577), which said descriptions now on file in the said Survey Office are as follows:

OLAA FOREST PARK RESERVE.

Olaa, Puna, Hawaii.

SECTION A.

Including Lots 363, 364, 377, 378, 389, 390, 391 and portions of Lots 379 and 380, of the Olaa Reservation Lots.

C. S. F. No. 2538.

Beginning at the East corner of Lot 365 of the Olaa Reservation Lots (Grant 4345 to E. G. Hitchcock) at the junction of 30-foot side road with the Volcano Road, the coördinates of which point are 47,311.24 feet South and 37,490.65 feet West of Government Survey Trig. Station "Olaa," as shown on Government Survey Registered Map No. 2250, and running by true azimuths:

1. 304° 12' 2975.0 feet more or less across Volcano Road and along the Southwest side of a 30-foot road to a point in middle of old Volcano Road;
Thence along the land of Keauu along the middle of the old Volcano Road, the direct azimuths and distances being:
2. 55° 15' 2720.0 feet more or less;
3. 39° 20' 1477.0 feet more or less;
4. 63° 00' 930.0 feet more or less;
5. 124° 12' 4905.0 feet more or less along the Northeast side of a 30-foot side road, across the Volcano Road to the West corner of Lot 389 of the Olaa Reservation Lots;
6. 214° 12' 1200.0 feet along Lot 1 of the Brughelli Settlement Association Lots;
7. 304° 12' 561.0 feet along Right of Purchase Lease No. 155 to Mrs. B. Bergstrom (Olaa Reservation Lots);
8. 249° 45' 976.0 feet along Right of Purchase Lease No. 155 to Mrs. B. Bergstrom (Olaa Reservation Lots);
9. 304° 12' 2689.0 feet along Right of Purchase Lease No. 155 to Mrs. B. Bergstrom (Olaa Reservation Lots) to the Volcano Road;
10. 211° 49' 430.0 feet along the Northwest side of the Volcano Road to the North corner of the Volcano Road and a 30-foot side road;
11. 124° 12' 150.0 feet along the Northeast side of a 30-foot side road to the South corner of Grant 4547;
12. 211° 49' 601.0 feet along Grant 4547 to Mrs. J. C. McStay;
13. 304° 12' 150.0 feet along Grant 4547 to Mrs. J. C. McStay;
14. 211° 49' 400.0 feet along Grant 4547 to Mrs. J. C. McStay along the Northwest side of Volcano Road;
15. 124° 12' 150.0 feet along Grant 4547 to Mrs. J. C. McStay;
16. 211° 49' 200.0 feet along Grant 4547 to Mrs. J. C. McStay;
17. 124° 12' 309.0 feet along Grant 4547 to Mrs. J. C. McStay to the South corner of Grant 4345 to E. G. Hitchcock;
18. 214° 12' 801.0 feet along Grant 4345 to E. G. Hitchcock;
19. 304° 12' 213.0 feet along Grant 4345 to E. G. Hitchcock;
20. 211° 50' 400.0 feet along Grant 4345 to E. G. Hitchcock to the point of beginning.

Area, 380 acres, more or less.

Excepting and reserving therefrom that portion of the Volcano Road passing through this tract (area, 6 acres), leaving a net area of 374 acres, more or less.

SECTION B.

Being the Koa Grove Reservation in the Olaa Summer Lots Subdivision.

C. S. F. No. 2544.

Beginning at the West corner of the Volcano Road and Kalanikoa Road,

the coördinates of which point referred to Government Survey Trig. Station "Kulani" are 34,351.6 feet South and 20,278.6 feet East, as shown on Government Survey Registered Map No. 2411, and running by true azimuths:

1. 50° 98' 310.0 feet along new line of the Volcano Road;
 2. 33° 04' 245.8 feet along new line of the Volcano Road;
 3. 149° 31' 707.7 feet along the land of Keauhou to an ohia post;
 4. 239° 31' 525.9 feet along Lot 2, Block C, of the Olaa Summer Lots (Grant 5645 to Thos. E. Cook), to an ohia post;
 5. 329° 31' 547.6 feet along Kalanikoa Road to the point of beginning.
- Area, 7 32-100 acres.

AREAS.

Section A—374 acres,
Section B— 7.32 "
Section C—150 "

531.32 "

(Seal) IN WITNESS WHEREOF, I have hereunto set my hand
and caused the Great Seal of the Territory of Hawaii
to be affixed.

DONE at the Capitol in Honolulu, this 20th day of
August, A. D. 1914.

LUCIUS E. PINKHAM,
Governor of Hawaii.

By the Governor:

WADE WARREN THAYER,
Secretary of Hawaii.

BY AUTHORITY.

RULE AND REGULATION OF THE BOARD OF COMMISSIONERS
OF AGRICULTURE AND FORESTRY, FORESTRY RULE NO. 1,
CONCERNING THE PROTECTION OF THE WATERSHEDS IN
NUUANU AND MAKIKI VALLEYS, HONOLULU, T. H.

The Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii hereby makes the following Rule and Regulation for the purpose of protecting from contamination the watersheds tributary to the Honolulu water supply system, within the boundaries of the Honolulu Watershed Forest Reserve:

SECTION 1. All persons and corporations are hereby prohibited from cutting or removing grass and other forage plants except under such permits as may be issued from time to time by the Board of Commissioners of Agriculture and Forestry (1) from the government land in Nuuanu Valley, Honolulu, Oahu, lying within the boundaries of the Honolulu Watershed Forest Reserve, as established by a proclamation signed by Acting Governor E. A. Mott-Smith on October 13, 1913, which area, in part, includes the entire mauka portion of Nuuanu Valley above Laukaha; and (2) from all that portion of Makiki Valley lying mauka of the Makiki Dam, on the government land of Makiki (also included in the above-named forest reserve), as shown by registered map No. 2554, on file in the office of the government survey.

SEC. 2. Any person violating the above rule shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not to exceed Five Hundred Dollars (\$500.00), as provided by Section 390 of the Revised Laws as amended by Act 82 of the Session Laws of 1905, and Act 112 of the Session Laws of 1907.

SEC. 3. This rule shall take effect upon its approval by the Governor.
Approved:

(Sgd.) LUCIUS E. PINKHAM,
Governor of Hawaii.

Honolulu, Territory of Hawaii, August 22, 1914.

APPOINTMENT OF FIRE WARDEN.

Notice is hereby given that the Board of Commissioners of Agriculture and Forestry has appointed

L. A. MOORE

District Fire Warden in and for Nuuanu Valley, District of Honolulu, Oahu.

ALBERT WATERHOUSE,

Acting President and Executive Officer, Board
of Agriculture and Forestry.

Honolulu, T. H., September 5, 1914.

Notice is hereby given that the following appointments of District Fire Wardens on the Island of Maui have been made by the Board of Commissioners of Agriculture and Forestry:

WILBUR A. ANDERSON

in and for that portion of the District of Koolau, Maui, lying to the East of Makapipi Gulch,

W. F. POGUE

(modification of district) in and for the East half of the District of Hamakualoa and that portion of the District of Koolau lying to the West of Makapipi Gulch.

ALBERT WATERHOUSE,

Acting President and Executive Officer, Board
of Agriculture and Forestry.

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